REMARKS/ARGUMENTS

The amendment to the specification corrects a minor typographical error. That the symbol Φ should have been μ is evident from the use of μm with reference to dimensions of the porous bodies elsewhere in the specification, e.g. at paragraphs 0045, 0061 and 0071. Consequently, the correction does not introduce new matter.

This invention is directed to improvements in wet paper web transfer belts. As explained in the specification, various known structures and compositions enable a transfer belt to exhibit good adhesion to a wet paper web as the web, carried by the transfer belt, moves away from the press part of a papermaking machine, and yet release the paper web reliably at a later stage in the papermaking process. The structures that make this mode of performance possible utilize a rough belt surface or hydrophilic filler particles. In the case of a rough belt surface, the press part flattens the rough surface, enabling a water film to cause the wet paper web to adhere to the belt. The roughness returns gradually as the belt moves away from the press nip, breaking up the water film and facilitating release of the wet paper web. The hydrophilic filler particles gradually attract the water in the water film on the surface of the belt, thereby breaking up the water film and facilitating release of the wet paper web.

A problem with the rough belt surface is that it becomes worn, and loses its ability to hold and then release the wet paper web. In the belt having embedded hydrophilic filler particles, loss of filler, both in the process of manufacture of the belt, and during use, make it difficult to achieve and maintain proper adhesion and subsequent release of the wet

paper web. In both cases, therefore, the desirable properties of the transfer belt gradually deteriorate over time.

This invention addresses the problem of deterioration over time by utilizing porous bodies, which are preferably in the form of porous fibers mixed into a high molecular weight elastic material forming the web side layer of the belt. The porous fibers draw water due to surface tension and break up the water film, thereby enabling release of the wet paper web from the belt. The porous fibers are firmly anchored in the wet paper web side layer. Thus, unlike an ordinary filler, which tends to fall off the belt during use, the porous fibers do not fall off. Their distribution at the surface of the belt does not change as a result of abrasion. Moreover, they do not depend on a gradual change in surface roughness in order to perform properly. Consequently, a transfer belt utilizing porous fibers exhibits good performance over a longer interval of time compared with that of conventional belts that depend on surface roughness or a conventional filler.

Claim 1 has been amended to make it clear that the belt is more than merely a porous belt; it includes porous fibers embedded in its wet paper web contacting surface. Thus claim 1 recites:

> "the wet paper web side layer having a wet paper web contacting surface and having porous fibers embedded therein. . .."

Claim 1 goes on to recite that:

> "said wet paper web side layer is obtained by mixing said porous fibers with high molecular weight elastic material. . ."

and that

> "a plurality of said porous fibers protrude from said wet paper web contacting surface."

The above quoted language distinguishes the invention from Gstrein in several respects.

First, Gstrein discloses a web transfer belt comprising a base body, a machine side layer, and a paper side layer, wherebny the paper side layer is a polymeric layer that comprises fibrous material on the surface. As asserted by the Examiner, the fibrous surface of Gstrein's belt allows the penetration of water to a limited distance within the belt, and the belt is therefore porous. But, claim 1, as amended, recites that the fibers are porous. Gstrein discloses a belt having a support fabric of polyamide, polyester, or aramid fibers, a water-resistant polymer layer overlying the support fabric, and a felt-like surface layer, the water-resistant polymer layer and the surface layer being typically composed of polyamide, polyester, polyolefin, polyvinyl or selected copolymers. Nowhere does Gstrein suggest that any of these fibers itself should be porous.

Second, in Gstrein, the fibrous material is needled to the polymeric layer. By contrast, in amended claim 1, the porous fibers are mixed in a high molecular weight elastic material.

In Hagfors, a fiber batt layer comprises two fibers with different surface properties, the transfer belt surface being provided with hydrophilic and hydrophobic fibers of different polarity, hydrophilicity, etc. Hagfors mentions that the fibers may differ in porosity, thereby implying that at least some of the fibers are porous. However, Hagfors does not teach that the wet paper web side layer is obtained by mixing

said porous fibers with high molecular weight elastic material.

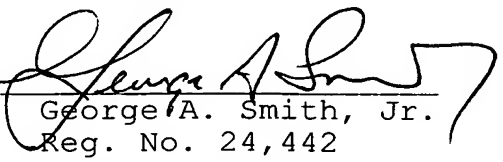
In Eklund, the paper side layer includes discrete filler particles such as Kaolin clay, embedded within the polymeric material of which some particles are exposed at the surface of the belt. By contrast, in amended claim 1, a wet paper web side layer includes porous fibers embedded within a high molecular weight elastic material, and a plurality of the porous fibers protrude from the wet paper web contacting surface.

New dependent claim 9 further distinguishes the invention from Gstrein, Hagfors and Eklund by reciting that the area ratio of the exposed parts of the porous fibers to the wet paper web contacting surface is in the range from 5% to 50%.

New dependent claim 10 further distinguishes the invention from Gstrein, Hagfors and Eklund by reciting that the porosity of the porous fibers is around 60%.

The claims, as amended, now define subject matter that is neither identically disclosed in, nor shown to have been obvious by, the prior art. The applicant respectfully requests favorable reconsideration and allowance.

Respectfully submitted,
HOWSON & HOWSON

By 
George A. Smith, Jr.
Reg. No. 24,442
Howson & Howson
Box 457
Spring House, PA 19477
Telephone: 215 540 9200
Facsimile: 215 540 5818